APPENDIX B

STANDARDS

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The Department of Defense (DoD) is actively working to reduce the number of unique standards and practices it requires. To achieve this goal, DoD is presenting its requirements to national and international standards organizations such as the American National Standards Institute (ANSI), the International Standards Organization (ISO), and the United Nations/ Electronic Data Interchange for Administration, Commerce, and Transport (UN/ EDIFACT) to influence standards development and modification. Within the digital environment, there are many standards that have much potential within acquisition programs. Perhaps the most important are those that are specifically designed to support the areas of Electronic Data Interchange (EDI) and Continuous Acquisition and Life-Cycle Support (CALS).

CALS and EDI standards can be used together to improve digital data interchange within all of DoD's key business areas. Functional users within DoD's systems acquisition, contracting, procurement, and logistics business areas are analyzing, testing, and preparing to take advantage of the benefits derived from the synergy between CALS and EDI regarding technical data exchange. In addition to the traditional purchasing transaction function of EDI, the ANSI X12 standard is being developed for and used within DoD's engineering, acquisition management, manufacturing, quality, transportation, and finance functions to transmit digital technical data as well. Functional DoD system users see the synergy between CALS and EDI as greatly improving their data intensive processes. The DoD and industry continue to identify business process improvements and cost savings by using CALS standards for data and transmitting it via EDI transaction sets.[1]

EDI Development and Standards

ANSI

This Institute is the coordinator and clearinghouse for national standards in the United States. The ANSI does not develop national standards; it charters organizations called Accredited Standards Committees (ASCs) composed of voluntary representatives from industry, labor, consumer, and government to prepare consensus standards. Upon public comment and approval, ANSI ASCs publish national standards.[2]

EDI Transaction Sets

For the acquisition program manager (PM) a key set of standards are ANSI X12, which describe standards for EDI. An EDI transaction involves the transmission of a business document in the form of a transaction set that is prepared in accordance with an ANSI X12 standard for that document. In other words, a transaction set is the electronic equivalent of a document, such as a Purchase Order or Request for Quotation, enclosed in an "electronic envelope." There are currently almost 200 transaction sets supporting a variety of business areas (see Appendix C) that are already in use by private industry today.[3] EDI represents an investment in a mature and tested methodology and technology with potentially immediate savings in information processing and maintenance costs for both the Federal Government and industry. It will also allow all stakeholders to take advantage of commercial-off-the-shelf (COTS) ANSI X12 compliant translation software and services.[4]

EDIFACT

In addition to ANSI X12 standards, there is another UN sponsored set of EDI standards called EDIFACT. The EDIFACT standards are primarily used in Europe and Asia. However, in order for everyone to benefit from a single global EDI standard, ANSI X12 has agreed to begin a gradual alignment with EDIFACT in 1997. All PMs should be cognizant of the transition when implementing EDI capabilities.[5]

CALS Standards

The DoD is applying established national and international standards to support the development of a truly integrated data environment (IDE). A key area is those standards that apply to the format and structure of digitized data. The standards described below, with MIL-STD designation, are indicative of these efforts. In many cases, DoD has approved the inclusion of these standards, without waiver for use, within acquisition contracts.[6]

SGML (Standard Generalized Markup Language) (ISO 8879)

Defined in MIL-STD-1840 as: "A standard that defines a language for document representation which formalizes markup and frees it of system and processing dependencies. It provides a coherent and unambiguous syntax for describing whatever a user chooses to identify with the document." HyperText Markup Language (HTML), the markup language used to portray and link documents/data on the world-wide web (WWW), is a modified subset of SGML. The SGML provides mechanisms for tagging, identifying, and accessing elements within a file such that they can later be extracted and used in a variety of ways for different uses. One valuable use for SGML is supporting the generation of Technical Manuals (TM) and Interactive Electronic Technical Manuals (IETM) by extracting data from different source files. When considering SGML as a deliverable format, the technical data manager must determine whether the applicable Document Type Definition (DTD) and Formatting Output Specification Instances (FOSI) exist and whether the necessary computer environment is available and in place to accept the SGML documentation. SGML requirements are described in Mil-M-28001.[7]

Graphics Formats

There are three principle graphics formats that are used to depict physical information Computer Graphics Metafile (CGM), Initial Graphics Exchange Specification (IGES), and raster.[8]

CGM (ISO 8632): A two-dimensional vector presentation used primarily for charts, figures, and simple drawings. CGM is the preferred format for incorporating graphical digital data into TM. Graphical enhancement has been added to the format, including complete integration of tiled compressed raster. Application structuring is currently in the process of being added to the CGM format. Extensions will allow CGM generators to tag "objects" for application significance. It will therefore serve to meet the needs of leading edge and future applications of hyperText and hypermedia documents, multimedia documents, IETMs, network-distributed graphical applications, and graphic object databases. CGM is further described in Mil-D-28003.[9]

IGES (ANSI Y14.26M): A three-dimensional vector presentation used primarily for engineering drawings. IGES may be the preferred choice for graphical data if a Computer-Aided Design (CAD) database were used as

the source. IGES is an ANSI standard which provides a neutral data format for exchanging mechanical product data. IGES was not originally intended to capture extensive product information for the entire product life cycle. Strategies for migrating IGES to Product Data Exchange using STEP (Standard for the Exchange of Product model data) (PDES) are being proposed by and discussed within the U.S. standards development bodies. IGES is further described in Mil-D-28000.

CCITT Raster Group 4 (CCITT T.6): A binary representation of an image. There are two types of raster data, tiled and untiled. Untiled raster data have no document architecture and are represented by a single compressed data entity. Tiled raster data resemble a two-dimensional grid with each tile or set of pixels representing a portion of an image. Previously CCITT stood for Consultive Committee on Telegraph and Telephone, but the organization has changed its name to Telecommunications Standards Sector (TSS). Raster is further described in Mil-D-28002.

STEP (ISO 10303)

An international standard which is being developed to give a complete computer-interpretable representation of product data in a neutral format throughout the complete product life cycle (design, engineering analysis, manufacture, support and maintenance, and disposal. This representation makes it suitable not only for file exchange but also as a basis for implementation, sharing, and archiving product databases.[10] With the proliferation of Computer-Aided Design, Computer-Aided Manufacturing, and Computer-Aided Engineering systems (CAD/CAM/CAE), all product data can be captured in digital form. The ability to transfer such product data in computer-readable format from one system to another is essential. STEP, while in use today, is a developing standard. However, once defined and implemented, it should enable such systems to accept, use, and exchange product data so that developers, suppliers, vendors, manufacturers, maintainers,

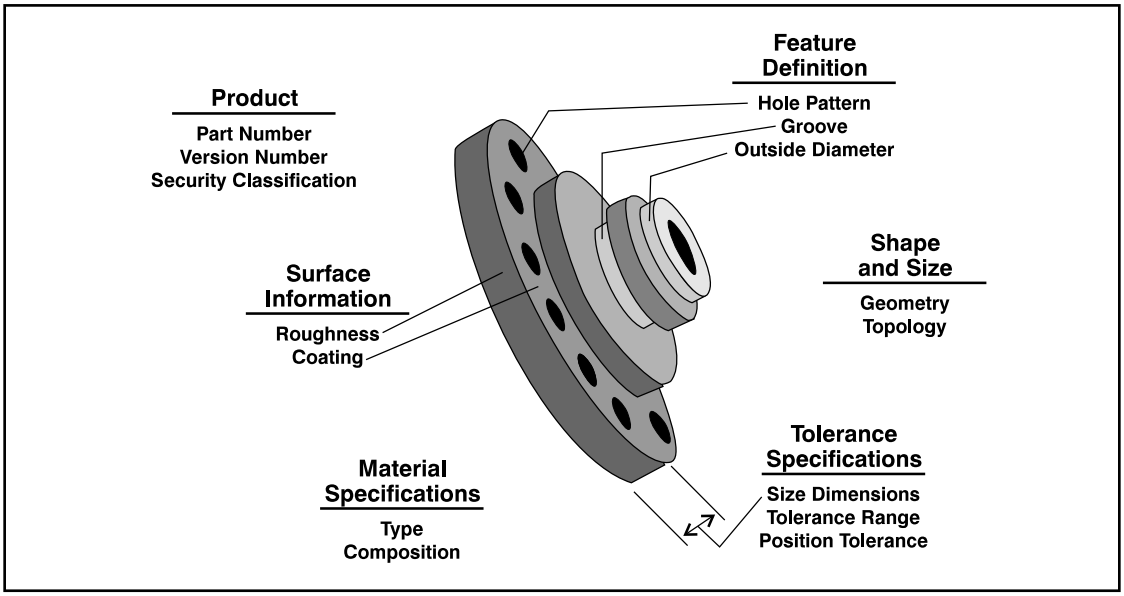

Figure B-1. Example of a STEP Data File

and users will be able to receive and supply information about product parts and materials digitally. An example of a STEP data file is depicted in Figure B-1 (Figure 11-2 from CALS Desktop Guide, pp. 11-54). Also refer to PDES below.

PDES

The PDES is being developed as a national standard, while being the U.S. counterpart to the STEP international standard.[11]

1. Tritle, G. (June 1996). CALS and EDI merging into the business lane of DoD and industry. (Unpublished paper by EDI Manager, Air Force PDSM Program Office). [On-line]. Available Internet: http://wpaftb1.wpafb.af.mil/ec_edi.html#edi2

2. DoD Electronic Commerce. (June 1996). Introduction to Department of Defense electronic commerce: A handbook for business, version 2. p. 25. Department of Defense, Deputy Under Secretary of Defense (Acquisition Reform). Washington, DC: Author.

3. Ibid.

4. Ibid., p. 27.

5. Ibid.

6. Defense Information Systems Agency. (May 1996). Memo from DISA allowing CALS standards and specifications to be used without waiver. [On-line]. Available Internet: http://www.iso/redstone.army.mil/laiso/waiver.html

7. DoD CALS Office. (September 29, 1995). Program manager's desktop guide for continuous acquisition and life-cycle support (CALS) implementation. p 6-16. Washington, DC: Author.

8. DoD CALS master plan, annex 2, vol. 1. (December 1995). [On-line]. Available Internet: http://www.acq.osd.mil/cals/annex_2.html

9. Ibid.

10. DoD CALS Office. (September 29, 1995). Program manager's desktop guide for continuous acquisition and life-cycle support (CALS) implementation. p. 10-53. Washington, DC: Author.

11. Ibid., p. G-13.